

**AMENDMENTS TO THE CLAIMS**

**Please cancel claims 1-49 without prejudice or disclaimer to the subject matter therein.**

**Please add new claims 50-97 as follows.**

Sub 17  
1-49 (canceled)

50. (New) A signal transmission apparatus for transmitting a first data stream and a second data stream, said signal transmission apparatus comprising:

a first error correction code (ECC) encoder operable to BCH encode the first data stream to produce an ECC encoded first data stream;

a second error correction code (ECC) encoder operable to Reed-Solomon encode the second data stream to produce an ECC encoded second data stream;

a modulator operable to modulate the ECC encoded first data stream according to an m-level PSK and to modulate the ECC encoded second data stream according to an n-level PSK to produce modulated signals;

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an inverse Fast Fourier transformer (IFFT) operable to convert the modulated signals into IFFT converted signals; and

a transmitter operable to transmit the IFFT converted signals.

51. (New) A signal transmission apparatus according to claim 50, wherein m is less than or equal to 4.

52. (New) A signal transmission apparatus according to claim 50, wherein n is greater than or equal to 4.

53. (New) A signal transmission apparatus according to claim 50, wherein m is less than or equal to 4 and n is greater than or equal to 4.

54. (New) A signal transmission apparatus for transmitting a first data stream and a second data stream, said signal transmission apparatus comprising:

a first error correction code (ECC) encoder operable to BCH encode the first data stream to produce an ECC encoded first data stream;

a second error correction code (ECC) encoder operable to Reed-Solomon encode the second data stream to produce an ECC encoded second data stream;

a modulator operable to modulate the ECC encoded first data stream according to an m-level QAM and to modulate the ECC encoded second data stream according to an n-level QAM to produce modulated signals;

an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into IFFT converted signals; and

a transmitter operable to transmit the IFFT converted signals.

55. (New) A signal transmission apparatus according to claim 54, wherein m is less than or equal to 4.

56. (New) A signal transmission apparatus according to claim 54, wherein n is greater than or equal to 4.

57. (New) A signal transmission apparatus according to claim 54, wherein m is less than or equal to 4 and n is greater than or equal to 4.

58. (New) A signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert an input signal into a FFT converted signal;

wherein the input signal has information of a first data stream and a second data stream, both of which are ECC encoded, said ECC encoded first data stream is modulated according to an m-level PSK, said ECC encoded second data stream is modulated according to an n-level PSK;

a demodulator operable to demodulate the FFT converted signal to produce a first demodulated data stream and a second demodulated data stream;

a first error correction code (ECC) decoder operable to BCH decode the first demodulated data stream to produce the first data stream; and

a second error correction code (ECC) decoder operable to Reed-Solomon decode the second demodulated data stream to produce the second data stream.

59. (New) A signal receiving apparatus according to claim 58, wherein m is less than or equal to 4.

60. (New) A signal receiving apparatus according to claim 58, wherein n is greater than or equal to 4.

61. (New) A signal receiving apparatus according to claim 58, wherein m is less than or equal to 4 and n is greater than or equal to 4.

62. (New) A signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert an input signal into a FFT converted signal;

wherein the input signal has information of a first data stream and a second data stream, both of which are ECC encoded, said ECC encoded first data stream is modulated according to an m-level QAM, said ECC encoded second data stream is modulated according to an n-level QAM;

a demodulator operable to demodulate the FFT converted signal to produce a first demodulated data stream and a second demodulated data stream;

a first error correction code (ECC) decoder operable to BCH decode the first demodulated data stream to produce the first data stream; and

a second error correction code (ECC) decoder operable to Reed-Solomon decode the second demodulated data stream to produce the second data stream.

63. (New) A signal receiving apparatus according to claim 62, wherein m is less than or equal to 4.

64. (New) A signal receiving apparatus according to claim 62, wherein n is greater than or equal to 4.

65. (New) A signal receiving apparatus according to claim 62, wherein m is less than or equal to 4 and n is greater than or equal to 4.

66. (New) A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus comprising:

a first error correction code (ECC) encoder operable to BCH encode the first data stream to produce an ECC encoded first data stream;

a second error correction code (ECC) encoder operable to Reed-Solomon encode the second data stream to produce an ECC encoded second data stream;

a modulator operable to modulate the ECC encoded first data stream according to an m-level PSK and to modulate the ECC encoded second data stream according to an n-level PSK to produce modulated signals;

an inverse Fast Fourier transformer (IFFT) operable to convert the modulated signals into IFFT converted signals; and

a transmitter operable to transmit the IFFT converted signals;

said signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert the transmitted IFFT converted signals into a FFT converted signal;

a demodulator operable to demodulate the FFT converted signal to produce a first demodulated data stream and a second demodulated data stream;

a first error correction code (ECC) decoder operable to BCH decode the first demodulated data stream to produce the first data stream; and

a second error correction code (ECC) decoder operable to Reed-Solomon decode the second demodulated data stream to produce the second data stream.

67. (New) A signal transmission system according to claim 66, wherein  $m$  is less than or equal to 4.

68. (New) A signal transmission system according to claim 66, wherein  $n$  is greater than or equal to 4.

69. (New) A signal transmission system according to claim 66, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

70. (New) A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus comprising:

a first error correction code (ECC) encoder operable to BCH encode the first data stream to produce an ECC encoded first data stream;

a second error correction code (ECC) encoder operable to Reed-Solomon encode the second data stream to produce an ECC encoded second data stream;

a modulator operable to modulate the ECC encoded first data stream according to an  $m$ -level QAM and to modulate the ECC encoded second data stream according to an  $n$ -level QAM to produce modulated signals;

an inverse Fast Fourier transformer (IFFT) operable to convert the modulated signals into IFFT converted signals; and

a transmitter operable to transmit the IFFT converted signals;

said signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert the transmitted IFFT converted signals into a FFT converted signal;

a demodulator operable to demodulate the FFT converted signal to produce a first demodulated data stream and a second demodulated data stream;

a first error correction code (ECC) decoder operable to BCH decode the first demodulated data stream to produce the first data stream; and

a second error correction code (ECC) decoder operable to Reed-Solomon decode the second demodulated data stream to produce the second data stream.

71. (New) A signal transmission system according to claim 70, wherein  $m$  is less than or equal to 4.

72. (New) A signal transmission system according to claim 70, wherein  $n$  is greater than or equal to 4.

73. (New) A signal transmission system according to claim 70, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

74. (New) A signal transmission method for transmitting a first data stream and a second data stream, said method comprising:

BCH error correction code (ECC) encoding the first data stream to produce an ECC encoded first data stream;

Reed-Solomon error correction code (ECC) encoding the second data stream to produce an ECC encoded second data stream;

modulating the ECC encoded first data stream according to an  $m$ -level PSK and modulating the ECC encoded second data stream according to an  $n$ -level PSK to produce modulated signals;

converting the modulated signals into an IFFT converted signal; and

transmitting the IFFT converted signal.

75. (New) A signal transmission method according to claim 74, wherein m is less than or equal to 4.

76. (New) A signal transmission method according to claim 74, wherein n is greater than or equal to 4.

77. (New) A signal transmission method according to claim 74, wherein m is less than or equal to 4 and n is greater than or equal to 4.

78. (New) A signal transmission method for transmitting a first data stream and a second data stream, said method comprising:

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BCH error correction code (ECC) encoding the first data stream to produce an ECC encoded first data stream;

Reed-Solomon error correction code (ECC) encoding the second data stream to produce an ECC encoded second data stream;

modulating the ECC encoded first data stream according to an m-level QAM and modulating the ECC encoded second data stream according to an n-level QAM to produce modulated signals;

converting the modulated signals into an IFFT converted signal; and

transmitting the IFFT converted signal.

79. (New) A signal transmission method according to claim 78, wherein m is less than or equal to 4.

80. (New) A signal transmission method according to claim 78, wherein n is greater than or equal to 4.

81. (New) A signal transmission method according to claim 78, wherein m is less than or equal to 4 and n is greater than or equal to 4.

82. (New) A signal receiving method comprising:

converting an input signal into a FFT converted signal;

wherein the input signal has information of a first data stream and a second data stream, both of which are ECC encoded, the ECC encoded first data stream is modulated according to an m-level PSK, the ECC encoded second data stream is modulated according to an n-level PSK;

demodulating the FFT converted signal to produce a first demodulated data stream and a second demodulated data stream;

BCH error correction code (ECC) decoding the first demodulated data stream to produce the first data stream; and

Reed-Solomon error correction code (ECC) decoding the second demodulated data stream to produce the second data stream.

83. (New) A signal receiving method according to claim 82, wherein m is less than or equal to 4.

84. (New) A signal receiving method according to claim 82, wherein n is greater than or equal to 4.

85. (New) A signal receiving method according to claim 82, wherein m is less than or equal to 4 and n is greater than or equal to 4.

86. (New) A signal receiving method comprising:

converting an input signal into a FFT converted signal;



wherein the input signal has information of a first data stream and a second data stream, both of which are ECC encoded, the ECC encoded first data stream is modulated according to an m-level QAM, the ECC encoded second data stream is modulated according to an n-level QAM;

demodulating the FFT converted signal to produce a first demodulated data stream and a second demodulated data stream;

BCH error correction code (ECC) decoding the first demodulated data stream to produce the first data stream; and

Reed-Solomon error correction code (ECC) decoding the second demodulated data stream to produce the second data stream.

87. (New) A signal receiving method according to claim 86, wherein m is less than or equal to 4.

88. (New) A signal receiving method according to claim 86, wherein n is greater than or equal to 4.

89. (New) A signal receiving method according to claim 86, wherein m is less than or equal to 4 and n is greater than or equal to 4.

90. (New) A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method comprising:

BCH error correction code (ECC) encoding a first data stream to produce an ECC encoded first data stream;

Reed-Solomon error correction code (ECC) encoding a second data stream to produce an ECC encoded second data stream;

modulating the ECC encoded first data stream according to an m-level PSK and modulating the ECC encoded second data stream according to an n-level PSK to produce modulated signals;

converting the modulated signals into an IFFT converted signal; and  
transmitting the IFFT converted signal;  
said signal receiving method comprising:  
converting the transmitted IFFT converted signal into a FFT converted signal;  
demodulating the FFT converted signal to produce a first demodulated data stream and a  
second demodulated data stream;

BCH error correction code (ECC) decoding the first demodulated data stream to produce the  
first data stream; and

Reed-Solomon error correction code (ECC) decoding the second demodulated data stream  
to produce the second data stream.

91. (New) A signal transmission and receiving method according to claim 90, wherein  $m$  is less  
than or equal to 4.

92. (New) A signal transmission and receiving method according to claim 90, wherein  $n$  is  
greater than or equal to 4.

93. (New) A signal transmission and receiving method according to claim 90, wherein  $m$  is less  
than or equal to 4 and  $n$  is greater than or equal to 4.

94. (New) A signal transmission and receiving method comprising a signal transmission method  
and a signal receiving method,

said signal transmission method comprising:

BCH error correction code (ECC) encoding a first data stream to produce an ECC encoded  
first data stream;

Reed-Solomon error correction code (ECC) encoding a second data stream to produce an  
ECC encoded second data stream;

modulating the ECC encoded first data stream according to an  $m$ -level QAM and modulating  
the ECC encoded second data stream according to an  $n$ -level QAM to produce modulated signals;

converting the modulated signals into an IFFT converted signal; and  
transmitting the IFFT converted signal;  
said signal receiving method comprising:  
converting the transmitted IFFT converted signal into a FFT converted signal;  
demodulating the FFT converted signal to produce a first demodulated data stream and a  
second demodulated data stream;

BCH error correction code (ECC) decoding the first demodulated data stream to produce the  
first data stream; and

Reed-Solomon error correction code (ECC) decoding the second demodulated data stream  
to produce the second data stream.

95. (New) A signal transmission and receiving method according to claim 94, wherein m is less  
than or equal to 4.

96. (New) A signal transmission and receiving method according to claim 94, wherein n is  
greater than or equal to 4.

97. (New) A signal transmission and receiving method according to claim 94, wherein m is less  
than or equal to 4 and n is greater than or equal to 4.